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G89-942 Can You Afford to Use Bovine Somatrophin (Bovine Growth Hormone)?

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Can You Afford to Use Bovine Somatrophin (Bovine Growth Hormone)?

Factors to consider before using Bovine Somatrophin in your dairy herd are covered here.

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- What is BST?
- Monitoring Cows Using BST

Much has been written recently about the effect of administering Bovine Somatrophin (BST) to dairy animals. The expected increase in income that could be generated by the use of BST catches producers' attention.

Before any producer uses BST, however, there are a few questions that should be addressed. The most crucial is, "Can BST administration be cash flowed in my dairy operation?"

The answer to this question is dependent on three crucial areas--your current herd average, herd management situation, and the costs involved in the application of BST.

Just what is BST? How does it work and how is it produced?

BST is a naturally occurring hormone produced by all cattle. It enhances their growth and milk secretion abilities. BST is always present in the milk. It has no side effects on humans since it is broken down, as all proteins are, as we digest our food. It is ***not*** a health concern to the public.

When BST is administered by an intramuscular injection, it increases the amount of milk a cow produces. The BST that is administered *does not* cause an increase in BST in the milk. The amount found in the milk is the same from untreated or treated animals.

BST is produced by biotechnology. Researchers have been able to isolate the gene that produces BST in cattle. This gene is incorporated into bacteria that then can produce the hormone in abundant quantities. This new technology also is used to mass produce other hormones. One such hormone, produced this way in order to be used by humans, is insulin.

Initial research results from Cornell University on BST-treated animals showed an increase in production from 30- 40 percent. As the hormone has been used under more commercial conditions, the increase has

been from 10-20 percent.

As dairy producers know, you do not get anything from a cow for nothing--in order to produce 10-20 percent more milk, the feed intake increases approximately 10 percent. BST does increase the cow's efficiency in converting feed to milk by five to eight percent.

Most researchers have not given BST treatments to cows before peak production. The cow is in a negative energy balance during this stage of lactation, and the extra stress is not advisable. Most experiments show BST first administered from 60-100 days after freshening.

Administration was originally done by means of a daily intramuscular injection. Research now has shown that one injection with either a 14- or 28-day release cycle increases production approximately 11 percent. As new technology becomes available, the administration of BST should be easier and longer lasting.

Questions have been raised concerning the side effects of BST usage. Current literature indicates there are no known side effects, such as breeding, reproductive or metabolic diseases associated with BST. As cattle increase in production due to BST administration, you may notice an increase in breeding problems. These reproductive concerns are the same ones any producer can expect as herd production level increases.

When a producer changes a management program, it usually results in a gradual increase in production. The producer has time to alter other practices gradually to cope with this increase. This is not true for BST. The results come virtually overnight. If the herd's production is increased 20 percent overnight, additional feed sources and feed delivery systems have to be available to increase feed consumption. The energy level in the diet needs to increase. A fat source needs to be added, such as roasted soybeans. A Total Mixed Ration (TMR) may be a necessity to increase feed intake. With increased feed consumption, it is necessary to increase the number of times cows are fed daily.

The following list of management practices should be in place before using BST:

- The herd should be on a production record keeping system, preferably Dairy Herd Improvement (DHI) testing.
- Producers should be using genetically superior sires through Artificial Insemination.
- Producers should have a Routine Herd Health Program in place.
- Cows should be tested for Somatic Cell Count (SCC).
- Hay and forages should be regularly analyzed.
- Producers should balance the ration.

These six practices are needed to feed, breed and monitor your cows properly. Accurate records are even more important when using BST.

Every producer will not get a response from BST. Management practices must be at a high level before any response will be noticed.

Producers can increase their herd production levels by more than 20 percent by adopting the six management practices mentioned previously.

Feed costs increase with BST, so it is important for producers to cash flow their operation to see if BST will benefit the herd and is a cost effective option. *Table I* shows a worksheet for producers to fill out to see what increase in production is needed to cash flow the increase in costs associated with BST.

To complete the calculations in *Table I*, producers need to know their current average daily feed cost per cow, and their current herd averages for milk and fat. With these figures the increase in production (5 percent, 10 percent, 15 percent or 20 percent) needed to generate enough income to offset additional expenses in using BST can be found.

Table I. Cash flow calculations for BST administration under four expected production increase scenarios.

	Gross Projections % Increase			
	5%	10%	15%	20%
1.[a] Current daily feed cost/cow	_____			
2.[b] Current herd average	_____			
3.[c] Expected increase milk, lbs	_____	_____	_____	_____
4. Expected increase fat, lbs	_____	_____	_____	_____
5. Gross income increase (Line 3 x A* + Line 4 x B*)	_____	_____	_____	_____
6. Gross income/cow/day (Line 5 ÷ 365)	_____	_____	_____	_____
7. Administration cost @ $5/hr	_____	_____	_____	_____
8. Daily cost/cow for BST substance	_____	_____	_____	_____
9. Increase in feed costs (Line 2 x 1.10[d])	_____	_____	_____	_____
Daily gain (loss) in income = Line 6 - Line 7 - Line 8 - Line 9	_____			

[a]Found on DHI Herd Summary Sheet.
[b]Found on DHI Herd Summary Sheet.
[c] Increase x Current Herd Average.
[d]1.10 refers to the new feed costs needed to properly feed BST treated animals.
*Values for A and B are found in *Table II*.

If you group your cattle according to production, you may want to substitute the group averages in *Table I*, rather than your herd production average. Producers may find it beneficial to use BST on certain production groups rather than for all cows. High and average production groups may be best suited for BST administration, whereas the use of BST in low production groups might not cash flow (or be economical).

On Lines 3 and 4 of *Table I* enter 5, 10, 15 or 20 percent of your current herd average. These are the expected gains you could see when using BST. Remember, these will be overestimated since BST is usually not given until 60 days post-freshening.

On Line 5 calculate your gross income from the additional milk and fat. The formula for various milk and fat prices are given in *Table II*.

Look up the values in *Table II* that most closely relate to your milk and fat price. Then multiply A times

Line 3 and B times Line 4. Add these two numbers and you have the value on Line 5--the Gross Income increase.

Table II. Values to calculate gross income increase for various milk and fat pricing systems.

Milk price	Fat differential	A[a]	B[b]
10.50	±13	.0595	1.3
10.50	±14	.0560	1.4
10.50	±15	.0525	1.5
10.50	±16	.0490	1.6
11.00	±13	.0645	1.3
11.00	±14	.0610	1.4
11.00	± 15	.0575	1.5
11.00	±16	.0540	1.6
11.50	±13	.0695	1.3
11.50	±14	.0660	1.4
11.50	±15	.0625	1.5
11.50	±16	.0590	1.6
12.00	±13	.0745	1.3
12.00	±14	.0710	1.4
12.00	±15	.0675	1.5
12.00	±16	.0640	1.6
12.50	±13	.0795	1.3
12.50	±14	.0760	1.4
12.50	±15	.0725	1.5
12.50	±16	.0690	1.6

[a]Price for one pound of non-fat milk for given milk and fat differential.
[b]Price for one pound of fat for given fat differential.

The value under A is the price you are paid for a pound of milk, excluding the fat.

Line 6--divide the figures on line 5 by 365 to estimate average daily income per cow.

Line 7--enter the cost of administering BST on a per cow basis either by daily injections or at 14- or 28-day intervals. A low estimate for an hourly rate would be $5/hour. Therefore, if you can inject 20 animals per hour, your figure would be $5÷20, equals .25 or 25 cents in labor per cow.

Line 8--enter the daily cost of the BST.

Line 9--take your current daily feed cost and multiply this by 1.10. This will equal your new daily feed cost, taking into account the extra feed needed by your cows.

Now subtract (Line 6 - Line 7 - Line 8 - Line 9). This figure is your increase in $ per day per cow when administering BST. If the figure is negative, you will lose income by using BST; if zero then this is your break-even point. If positive, you should expect to gain income by using BST.

Many individuals may tell you BST will add nothing to your cost. This is not true. Very few technologies are cost neutral. Every time you change a management practice, you should go through this same exercise to be certain it will cash flow.

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